producing items, particularly in view of the number of materials which may be connected and the arrangement of functional elements on a single-use bag.

Summary

According to an example, the present disclosure refers to a single-use container, particularly a single-use bag such as a single-use bioreactor, comprising: a base material; and at least one functional element being at least partially, preferably permanently connected with the base material, wherein the functional element is obtained by a three dimensional printing technique from at least one printable material, wherein the printable material and the base material is heated during the three dimensional printing thereby at least partly connecting the printed functional element to the base material.

According to an aspect, the present disclosure refers to a method of producing a single-use container by producing a functional element and connecting the functional element with a base material of the container, comprising the steps of: providing the base material; three dimensional printing of the functional element from a printable material on a surface of the base material; and connecting at least a portion of the functional element with at least a portion of the base material by supplying heat to the printable material and the base material simultaneously to and/or prior to at least an interval of the step of three dimensional printing, wherein the functional element is a port.

According to yet another aspect, the present disclosure refers to an assembly device for producing a functional element and connecting the functional element with a base material to produce a single-use container, comprising: a three dimensional printing device for printing a functional element on a surface of the base material; and at least one heating device for supplying heat to the printable material and the base material during the three dimensional printing and thereby at least partly connecting the printed functional element to the base material, wherein the functional element is a port.

The problem is solved by the above aspects. Preferred examples are disclosed herein.

The aspects of the present disclosure provide a single-use container, a method for producing this container and an assembly for producing items, such as a single-use container allowing multiple materials to be combined and/or connected. Further, the structures of the functional elements, as well as the arrangement on a single-use bag may be improved.

According to one example, there is provided a single-use container, for example a single-use bioreactor, comprising

- a base material, particularly a wall element and/or a wall and/or skin of the single-use container, particularly of a single-use bioreactor which may be a single-use bag, such as a foil, a thin sheet and/or a stock sheet; and
- at least one functional element, for example a port, a sensor holder, a sensor part or the like, being at least partially, preferably permanently connected with or to the base material, wherein the functional element is obtained by a three dimensional (3D) printing technique from at least one printable material, wherein the printable material and/or the base material is/are heated during printing thereby (so as to) at least partly connecting the printed functional element to the base material.

In other words, a single-use container, which may be a single-use bag, comprises at least two parts: One part, i.e. a base material, such as for example a stock material and/or a pre-made item and/or a pre-made bag or a pre-made part thereof. The base material being connected to or with at least one second part. The at least one second part is a functional element which particularly is produced by being printed directly onto the base material. At least a portion or a part of the functional element may be in direct contact with the base material being directly connected to the base material such that a physical contact is established. The connection of the two parts, i.e. the base material and the at least one functional element, is established during at

Claims

1. Method of producing a single-use container by producing a functional element and connecting the functional element with a base material of the container, comprising the steps of:

- providing the base material;
- three dimensional printing of the functional element from a printable material on a surface of the base material; and
- connecting at least a portion of the functional element with at least a portion of the base material by supplying heat to the printable material and the base material simultaneously to and/or prior to at least an interval of the step of three dimensional printing, wherein the functional element is a port.

2. Method according to claim 1, wherein the step of supplying heat comprises the step of pre-heating the base material.

3. Method according to claim 1 or 2, wherein the step of three dimensional printing of the functional element comprises a step of printing from printable material, at least one of: acrylics, EVA, ABS, PC, PE, PMMA, PLA, PES, POM, PEEK, PEI, PP, PS, PTFE.

4. Method according to any one of claims 1 to 3, wherein the step of three dimensional printing comprises the step of printing from a nanoparticle ink and/or spraying atomised metal and/or melting a metal powder and/or aerosol jetting an electronic component.

5. Method according to any one of claims 1 to 4, further comprising the step of removing a portion of the base material and/or removing an excess portion of the functional element.

6. Method according to any one of claims 1 to 5, wherein the three dimensional printing of the functional element comprises a fused filament fabrication, a drop-by-drop application of the printable material and/or a layer-by-layer application of the printable material.

7. Method according to any one of claims 1 to 6, further comprising

- removing, particularly for cutting away excess material from either the functional element and/or the base material; and
- at least partly recycling the excess material being removed by particularly reusing it in the three dimensional printing step and/or in a step of manufacturing the base material.

8. Assembly device for producing a functional element and connecting the functional element with a base material to produce a single-use container, comprising:

- a three dimensional printing device for printing a functional element on a surface of the base material; and
- at least one heating device for supplying heat to the printable material and the base material during the three dimensional printing and thereby at least partly connecting the printed functional element to the base material, wherein the functional element is a port.

9. Assembly device according to claim 8, further comprising means for providing and positioning the base material, preferably a conveyor belt, and optionally the assembly device is configured to provide the base material from a roll.

10. Assembly device according to any one of claims 8 or 9, further comprising

- means for removing, particularly for cutting away excess material from either the functional element and/or the base material; and

- means for at least partly recycling the excess material being removed, particularly comprising means for heating and providing the excess material, being removed, to the three dimensional printing device and/or to a system which manufactures the base material.

11. A single-use container produced by the method of any one of claims 1-7 or the assembly device of any one of claims 8-10.